Letter to the Editor

Penetrating nail-gun injury of the thoracic descending aorta

Dear Editor,

Penetrating aortic injuries are uncommon and highly lethal, and extremely few patients make it to the hospital alive. Here, we describe a rare case of penetrating aortic injury from accidental discharge of a nail gun.

A 44-year-old man was brought to the emergency department of a local hospital because of an accidental nail-gun injury to the chest. Chest radiography revealed a 9-cm nail in the left chest and mediastinum (Fig. 1A). He was transferred to our hospital for further treatment. On admission, he was found to be completely alert, blood pressure was 90/60 mmHg, heart rate was 110 b.p.m., and blood oxygen saturation was 97% on room air. There was an entry wound in the left anterior chest wall but no exit wound. Chest computed tomography revealed a foreign body that had penetrated the anterior chest wall, left lung, and anterior and posterior descending aortic walls and was lodged into the 7th thoracic vertebral body (Fig. 1B). He was immediately transferred to the operating room and positioned in the right lateral position. A left posterolateral thoracotomy was performed using partial cardiopulmonary bypass through a left femoral arterial cannula and a right femoral venous cannula. Although the nail penetrated the lung and aorta, no damage was observed in the esophagus and trachea. Because there was broad adventitial hematoma suggesting a dissection in the descending aorta, we decided to perform aortic reconstruction with the tube graft. After aortic cross-clamping, transection of the descending aorta was performed to assess the nail (Fig. 1C). After removal of the nail from the thoracic vertebral body (Fig. 1D), no cerebrospinal fluid leakage was observed. The aorta was replaced with a 14-mm tube graft and a suture closed the penetrating canal in the left

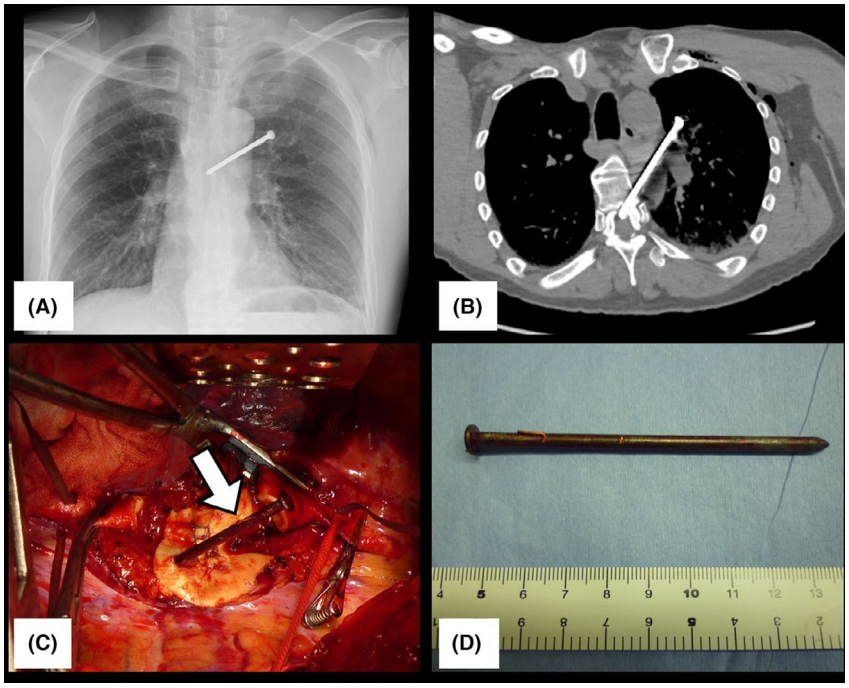

Fig. 1. Imaging of a 44-year-old man with an accidental nail-gun injury to the chest. A, Chest radiograph demonstrates a nail in the mediastinum. B, Multidetector computed tomography demonstrating a nail penetrating the thoracic aorta. C, Intraoperative view depicts the nail (arrow) just before its removal. D, The removed nail, with a diameter of approximately 2 mm and a length of approximately 9 cm.

upper pulmonary lobe. He was weaned from cardiopulmonary bypass without any complication. He was discharged uneventfully 14 days after the accident.

The first nail-gun injury was reported in 1959, the year in which the device was introduced in the construction industry.[1] Penetrating descending aortic injuries are quite rare. In an epidemiologic study, only 80 were found in a study of approximately 4500 patients over 30 years.[2] In patients with a penetrating chest nail-gun injury, the presentations can vary from instability requiring urgent intervention to hemodynamic stability.[3] With modern imaging techniques, such as computed tomography, magnetic resonance imaging, and transesophageal echocardiography, most great vessel and aortic injuries can be diagnosed with a high degree of accuracy. Currently, multidetector computed tomography is the most widely used technique for the diagnosis of cardiovascular pathologies.[4] However, the management of penetrating aortic injuries remains challenging, and surgery is the accepted treatment, regardless of hemodynamic stability. Cardiopulmonary bypass is a safe alternative for the maintenance of hemodynamic stability, confirmation of the precise state of the injured vasculature, and safe repair of the injury. In conclusion, nail-gun injury of the aorta is rare, and appropriate diagnostic modalities and therapeutic approaches are essential for obtaining good outcomes.

DISCLOSURE

Approval of the research protocol: N/A.
Informed consent: Informed consent was obtained from the patient.
Registry and the registration no. of the study/trial: N/A.
Animal studies: N/A.
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